

WHAT IS CLAIMED IS:

1. A power semiconductor module, said semiconductor module separably mountable on at least one of a base plate and a heat sink, said power semiconductor module comprising:

a packaging member;

at least one power semiconductor component;

at least one insulating substrate having a first and a second main surface;

at least a first metallic layer on said first main surface;

at least a second metallic layer on said second main surface;

said power semiconductor component on said first metallic layer;

at least one additional conductive layer substantially arranged proximate an edge of said substrate; and

said at least one additional conductive layer electroconductively connected with said second metallic layer on said second main surface of said substrate, whereby an insulation strength of said module is improved.

2. A power semiconductor module, according to claim 1, wherein:

said at least one additional conductive layer is at least a first clearance distance from said first metallic layer on said first main surface of said substrate.

3. A power semiconductor module, according to claim 1, wherein:

said at least one additional conductive layer includes at least one of a metallic layer and a sealing gasket.

4. A power semiconductor module, according to claim 3, wherein:

said additional conductive layer includes said at least one sealing gasket; and

said at least one sealing gasket is an elastic material and is at least one of an electroconductive material and a material having an electroconductive surface portion.

5. A power semiconductor module, according to claim 4, wherein:
a specific resistance between said sealing gasket and said second metallic layer being less than about 10 k Ω .

5 6. A power semiconductor module, according to claim 1, further comprising:
an adhesive bond; and
said adhesive bond electroconductively connecting said additional conductive layer with said second metallic layer.

10 7. A power semiconductor module, according to claim 6, wherein:
said adhesive bond fixing a portion of said substrate to a portion of said packaging, whereby a strength of said module is increased.

8. A power semiconductor module, according to claim 6, wherein:
a specific resistance of said adhesive bond being less than about 10 k Ω .

15 9. A power semiconductor module, according to claim 1, further comprising:
at least one through-connection; and
said through-connection electroconductively connecting said at least one additional conductive layer with said second metallic layer.

10. A power semiconductor module, according to claim 9, wherein:
said through-connection is a metallic through-connection.

20 11. A power semiconductor module, according to claim 1, further comprising:
at least one sealing gasket; and
said at least sealing gasket being said additional conductive layer and integrally electroconductively connecting said first metallic layer with said second metallic layer.

25 12. A power semiconductor module according to claim 11, wherein:
said at least one sealing gasket sealingly joins portions of said first metallic surface, said second metallic surface, and said substrate with portions of said packaging member, whereby an assembly reliability of said module is increased.

13. A power semiconductor module, according to claim 1, wherein:
a specific resistance of said electroconductive connection between said at least one additional conductive layer and said second metallic layer is less than about 10 k Ω .

5 14. A power semiconductor, according to claim 1, further comprising:
at least one further conductive layer on said first main surface of said substrate between said first metallic layer and said at least one additional conductive layer.

15 15. A power semiconductor, according to claim 14, wherein:
said at least one further conductive layer arranged substantially parallel said
10 additional conductive layer, whereby said at least one further conductive layer are effective as field rings enabling a spreading equipotential lines between said first metallic layer and said additional conductive layer.

16. A power semiconductor module, comprising:
a packaging member;
15 at least one power semiconductor component;
at least one insulating substrate having a first and a second main surface;
at least a first metallic layer on said first main surface;
at least a second metallic layer on said second main surface;
said power semiconductor component on said first metallic layer;
20 at least one additional conductive layer substantially arranged proximate an edge of said substrate;
said at least one additional conductive layer electroconductively connected with said second metallic layer on said second main surface of said substrate;
said at least one additional conductive layer at least a first clearance distance
25 from said first metallic layer on said first main surface of said substrate; and
said at least one additional conductive layer includes at least one of a metallic layer and a sealing gasket.

17. A power semiconductor module, according to claim 16, wherein:
said at least one sealing gasket is an elastic material and is at least one of an
electroconductive material and a material having an electroconductive surface
portion.

5 18. A power semiconductor module, according to claim 16, wherein:
said electroconductive connection between said one additional layer and said
second metallic layer is at least one of a through-connection passing through a portion
of said substrate and a side-connection passing around an edge of said substrate.

10 19. A method of manufacturing a power semiconductor module, comprising the
steps of:

forming a first metallic layer on a first main surface of a substrate;
forming a second metallic layer on a second main surface of said substrate;
positioning at least one power semiconductor component on said first metallic
surface distal from an edge of said substrate;

15 positioning a packaging member spaced from and proximate to said edge of
said substrate;

forming at least one additional conductive layer on said first main surface of
said substrate proximate said edge of said substrate and spaced from said first
metallic layer; and

20 electroconductively connecting said at least one additional layer to said
second metallic layer, thereby improving an insulation strength of said module.

20. A power semiconductor module, mounted on at least one of a base plate and a
heat sink, said power semiconductor module comprising:

a packaging;

25 at least one power semiconductor component;

at least one insulating substrate provided on a first side with a first metallic
layer and on a second side with a second metallic layer;

said at least one power semiconductor component on said first metallic layer;

said first metallic layer on a first main surface of said substrate and said second metallic layer is on said second main surface of said substrate , and

5 at least a one additional conductive layer arranged proximate an edge of said substrate and electroconductively connected with said second metallic layer on said second main surface of said substrate, thereby improving an insulation strength of said power semiconductor module.

21. A power semiconductor module, according to Claim 1, wherein:

10 said at least one additional conductive layer is structurally identical with said first and said second metallic layers; and

 said at least one conductive layer being formed by the same manufacturing technique as said first and said second metallic layers.

22. A power semiconductor module, according to claim1, wherein:

15 said first metallic layer is internally structured to enable a circuit-friendly design of said power semiconductor module.

23. A power semiconductor module, according to Claim 1, wherein:

20 said electroconductive connection between said at least one additional conductive layer is at least one local through-connection between said second metallic and said at least one conductive layer; and

 said at least one local through-connection being proximate said edge.

24. A power semiconductor module, according to claim 1, wherein:

25 said electroconductive connection between said at least one additional conductive layer is established by an electroconductive adhesive which fixes said substrate in said packaging.

25. A power semiconductor module, according to claim 1, wherein:

said electroconductive connection between said at least one additional conductive layer and said second metallic layer is a sealing gasket; and

said sealing gasket being made from at least one of an elastic and an electroconductive material and a material provided with an electroconductive surface.

5

26. A power semiconductor module, according to Claim 1, further comprising:
at least one further conductive layer between said first metallic layer and the additional conductive layer; and

said at least one further conductive layer arranged substantially parallel to the additional conductive layer, whereby said at least one further conductive layer is effective as a field ring.

10

27. A power semiconductor module, according to claim 1, wherein:
a specific resistance of said electroconductive connection between said at least one additional conductive layer and said second metallic layer is less than about 10 k Ω .

15